Research Progress and Trend of Functional Physical Training for Young Badminton Players

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Keywords: Adolescents; Badminton players; Functional physical training; Progress and trends

Abstract: Using documentary, logical analysis, grasps the functional training in juvenile badminton project practical application, through to the domestic and foreign advanced theory of physical training related to comb and expounded, on the basis of predecessors' research, in view of the badminton project, the author analyzes and researches on the special character, reveal the characteristics and value of functional training, in order to provide reference for badminton scientific physical training, and provide reference basis for teenagers badminton athlete functional training, perfect the youth badminton fitness theory system and special physical training method.

With the rapid development of competitive sports, the gap between the skills and tactics of high-level athletes is getting smaller and smaller, and the physical level has become a key factor in the impact of competitive sports. However, with the emergence and development of the new training method of functional training, some problems have arisen, especially in the case of various sports, the use of similar functional training without purpose, thus resulting in training and practice. In the dogmatic situation, after all, the demand for special ability of different sports projects must have the individualized characteristics of the project. In order to break this unfavorable situation, it is necessary to study the impact of functional training on athletes' physical fitness, especially the special ability, when performing functional training for athletes of different projects.

1. Research Background and Related Issues

Badminton has always been China's traditional competitive sports. However, with the exchange of outstanding professionals, in the context of the modern badminton tactics training has been transparent, the strength of athletes in various countries is increasing day by day, enough to compete with China in each individual item. The pattern of modern badminton development has long ceased to be a Chinese one. The Chinese National Badminton Team won all the gold medals in five individual events at the 2012 London Olympics, creating the most brilliant record in the history of the Chinese badminton project. At the 2016 Rio Olympic Games, the Chinese National Badminton Team won only There are two single gold medals for men's singles and men's doubles. In the latest rankings of the World Badminton's individual worlds in November 2016, there was no Chinese player. This is the first time that the Chinese badminton team has encountered in recent decades status. In response to this situation, it is worthwhile for every person engaged in the badminton career to think and reflect. To a large extent, the training of badminton in China is relatively lagging behind, and the talent ladder has caused a fault. Therefore, strengthening the training of reserve talents in China and improving the training and competition level of young badminton players are important ways to ensure the sustainable development of badminton in China.

2. Development and Physical Characteristics of Adolescent Athletes

The physical health of adolescents is a major issue concerning the quality of the Chinese nation. China has also paid more and more attention to the research work of young people's physique. In recent years, under the leadership of the State Sports General Administration and other relevant

  DOI: 10.25236/mfssr.2019.173

departments, the physique of children and adolescents in China has been planned many times. Organized large-scale research has yielded significant and valuable research results.

2.1 Basic Rules of Growth and Development of Children and Adolescents.

Development generally refers to changes in the structure and morphology of various tissues and organs, and the differentiation and improvement of various system functions before the human body matures. The basic laws of growth and development of children and adolescents have the following characteristics: (1) The growth and development process of the human body is a continuous gradual process. The development of human physiology, psychology and exercise capacity shows different stages of different ages. (2) The speed of human development is a regular development of the wave curve, and each organ, system, and organization has its own unique development law. The difference is manifested in different people, and the degree of development may be different. .(3) During the same period and throughout the development process, the ratio of growth and development speed of various parts of the human body is not equal, and it is not grown in proportion. Tanner[1], Malina & Bouchard[2] found that individuals grew fastest in the first year after birth, and then gradually slowed down to adolescent growth spurt (girl is about 10 years old, boy is about 12 years old) Start to speed up. During the height spurt period, the height growth rate is the highest, and then gradually slows down.

For the grassroots coaches, understanding the appropriate ages for different sports special primary materials and mastering the age characteristics of children and adolescents' growth and development is directly related to the design and effect level of training. At present, most of the research on training experience is high-level or national team. There are few empirical studies on the impact of functional training of children and adolescents on physical fitness in grassroots sports schools, which are urgently needed to be supplemented by scholars.

2.2 Changes in Body Shape During Childhood.

In the characteristics of skeletal development, the bones of children and adolescents are prone to bending and deformation under external force or gravity, and the ability to withstand pressure and muscle tension is poor; muscles have weak contraction strength, poor endurance, and fatigue, but recover faster, and Large muscle groups develop relatively early. Therefore, when focusing on the development of large muscle groups, there should also be planned and purposeful development of small muscle groups to promote the development of overall muscle strength balance and improve coordination between muscle groups, which will benefit children. Teenagers build correct and precise action patterns.

In childhood, the height, weight and chest circumference of males and females showed different performances in different developmental types. The beginning time of the youthful bulging period was earlier than normal, and the normal type was earlier than late. Moreover, both male and female athletes showed a trend of increasing body weight and bmi with age, and the growth rate of male fat-removing body was higher than that of female. Gao Binghong[3] pointed out that the growth of male athletes in children should precede weight gain. It may be because the growth rate of lean body mass at this stage is higher than that of ordinary teenagers. Trainers should pay attention to this situation during training and material selection. In order to avoid the occurrence of sports injuries during training or to ignore potential seedlings when selecting materials.

2.3 Characteristics of Changes in Physical Function During Childhood.

Pulse, vital capacity, blood pressure and substance metabolism are important indicators of the degree of development of the body's function. During childhood and adolescence, the human body functions with unique age characteristics: (1) The pulse of children and adolescents gradually slows down with age, and gradually stabilizes when they are around 18 years old. The output per stroke and the output per minute are lower than those of adults. Functional level, and the cardiac output per kilogram of body weight is large (2) systolic blood pressure, diastolic blood pressure increase with age, 18, 19 years old tend to be stable.(3) The lung capacity increases with age, and the oxygen uptake rate is the fastest when it is around 10 and 13 years old. The overall development trend of

children's and adolescents' body functions shows an increasing trend with age. In terms of annual average growth value, male athletes are higher than female athletes[4].

2.4 Characteristics of Changes in the Quality of Children's Sports.

Human growth and development have disequilibrium at different ages. The quality of children's sports will show the "sensitive period" of development, which is the sensitive period of physical quality development (Table 1), which is an important basis for athletes to select materials.

Table 1 Sensitive period of different physical development of adolescents

Quality	First sensitive period (years)	Second sensitive period (years)
Aerobic endurance	10~12	17~18
Special endurance (sprint)	14~16	-
Anaerobic endurance (medium and long run)	15~19	-
Movement rate	9~12	14~16
Exercise response	9~12	-
Fast power	9~10	14~17
Absolute power	14~17	-
Flexibility	7~10	13~14
Sensitivity	7~10	16~17

Branta[5] Jones[6] and others have shown that the average ability of boys in sports quality tests such as outbreak, speed endurance, sensitivity and balance shows an increase with age. .The growth of these sports qualities of girls slowed down around the age of 13.

In summary, in the research work of adolescent development characteristics at home and abroad, the main aspects of previous research are: the growth and development of children and adolescents, body shape, physical function, the development of exercise capacity, and the sensitive period of physical development. A lot of research results have been obtained in these aspects. At present, the research on the growth and development of adolescents is still an important research topic at home and abroad, and it is still necessary to conduct new and in-depth research. Only a detailed analysis of the current growth and development of children and adolescents in China, and the development of appropriate physical improvement policies, can further enhance the physical fitness of children and adolescents in China, and promote a virtuous circle of national sports education.

3. Study on the Physical Strength of Young Badminton Players

The athlete's physical development level is composed of his body shape, body function and sports quality. The athlete's physical ability refers to the basic athletic ability of the athlete's body and is an important link that reflects the athlete's competitive performance level. The purpose of the special physical training for badminton is to serve the skills and tactics.

In the badminton competition, not only the psychological quality, tactics, and technical contests, but also the physical strength contest, physical fitness largely determines the use of tactics and technology, affecting the outcome of the game. Li Chunlei[7] pointed out that the energy metabolism characteristics of badminton are the three energy systems co-powered, respectively, the phosphoric acid system is the main, the lactic acid energy system is supplemented, and the aerobic energy supply system runs through the whole process, each accounting for a certain proportion. The statistics on the time structure of badminton games show that the rounds within 10s account for more than 80%, and the phosphoric acid energy supply system contributes the most, but with the increase of more than 10s in modern badminton, the glycolysis energy supply system has become more It is important.

At present, in the process of developing sports quality, Chinese young male badminton players give priority to the development of speed, sensitivity and special strength, pay attention to

strengthening the training of buckwheat phosphate system level, paying less attention to the improvement of the level of the sugar fermentation system. The physical training program can be designed according to the age level, and the training cycle of physical fitness is unscientific and other factors, which limits the improvement of the scientific training level of Chinese youth badminton.

In summary, the research on the physical performance of young badminton players is mainly focused on the energy metabolism characteristics of the badminton project, the sensitive period characteristics of the development of adolescents' physical fitness, the formulation of the physical training program, and the construction of the evaluation system. Badminton has always been a traditional Chinese advantage project, and the country attaches great importance to the training of young athletes. However, many grassroots coaches have less research on physical fitness training, insufficient understanding of the characteristics of badminton sports special physical fitness during training, and insufficient training methods and periodic arrangements. Therefore, in the physical training of young badminton players, the coaches need to recognize the physical characteristics of the badminton sports, guide the physical training with the law of winning, grasp the sensitive period of the development of the young people's physical quality, and promote the sports quality through effective methods and means. Developed to the limit, fully tap the potential of sports quality, and continuously deliver excellent reserve talents for the development of badminton in China.

4. Research Status of Functional Training

4.1 Concept and Origin of Functional Training.

The concept of functional training was first proposed by foreign scholar Gray[8]. Since then, through the elaboration of scholars at home and abroad, most studies believe that functional training comes from the field of physiotherapy and rehabilitation, because human movement is a multi-joint three-dimensional movement, in line with The purpose of functional training. Michael Boyle[9] pointed out that “function” is essentially a goal. The concept of functional training or functional practice actually originates from the field of sports medicine. Rehabilitation thinking can usually enter the physical room from the physical therapy room and sports training field to help athletes. Improve the level of physical motor function.

Functional exercise is a series of activities that integrate daily physical activity and competitive sports. It integrates mechanically characteristic, coordinated or energetic activities into daily life. Functional training is a kind of overall training in actual exercise, and is not limited to local muscle training, and achieves stability and efficiency through training exercise mode[10].

Chinese scholar Yin Jun and Yuan Shoulong[11] believe that functional training is a theoretical system developed to meet the needs of professional sports. It includes physical therapy and motor function training. Among them, physical therapy is mainly used for dysfunction detection before exercise, and sports functional training is for body training for people without movement disorder, and it is also the main content of functional training. Bao Chunyu[12] believes that functional training is close to the "target sports" training, which means close to the special. It is a training system that enhances the working function level of the body movement system as a whole to achieve a higher level of competition. Traditional training is the basis of functional training. Specialized training is the fundamental goal of functional training. Functional training reduces the time for general training to transform into special training.

In summary, functional training is a purposeful training method. Different scholars have certain differences in understanding and understanding of functional training from the perspective of not. However, through the training principle and mechanism analysis of functional training, For the purpose of improving the overall working ability and efficiency of the whole body muscle, through the control of the nerve-muscle system, the joints and muscles are adjusted, and the precise cooperation between the joints and the muscle groups is completed, thereby improving the level of the nervous system to precisely control the muscle fibers. Kind of training. There is a high degree of compatibility between functional training and sports rehabilitation, which guarantees the safety of

competitive sports training and prolongs athletes' sports life. However, functional training has shortcomings in special strength training and special ability improvement. Therefore, it should be combined with traditional training to supplement the promotion of special athletic ability.

4.2 Functional Training for the Prevention of Sports Injuries.

Li Chunlei, the head coach of the former national badminton team, showed that the national badminton team athletes have higher sports injury rate, and the targeted functional corrective exercises can prevent sports injuries and improve the athlete's body shape and improve the quality of the action. Improve the transmission efficiency of the power chain.

The concept of functional training is that athletes are injured because of muscle tension, uncoordinated movements, poor power chain, and neglect of the above problems. Functional training promotes the overall balanced development of the body. The training method is scientific and surrounds the functional characteristics of the human body. The requirements for the action mode are high, and the development of the ability of coordination and balance is emphasized. The core purpose of functional training is to enhance athletic performance[13] while significantly reducing sports injuries.

4.3 Functional Training to Promote Specific Physical Fitness and Improve Athletic Performance.

In the study of functional training to improve athletes' special ability, functional training emphasizes the specialization of special movements and movement modes of sports, and emphasizes the training of action patterns that have improved the project. Among the many factors affecting the athletes' level of sports and sports performance in China, physical training concepts and methods are one of the most important factors. Traditional physical training is the foundation of modern physical training. Functional training is the link and a key auxiliary factor to meet the requirements of specialization.

Studies have shown that functional training is a new concept and new method that has a positive impact on athletes' special skills. It can significantly improve the athlete's physical fitness level, thus further helping athletes to be more stable and coordinated in the training performance. Its promotion is mainly manifested in the significant improvement of the physical fitness level. The bilateral asymmetry found in the early fms test has been improved, and it has a significant effect on the improvement of athletes' basic motor function, speed, sensitivity, and upper limb outbreak[14].

5. Conclusion

In terms of connection with general physical training and special training, the research shows that functional training plays an auxiliary role in the physical training of young badminton players. Functional training can not replace special physical training. The two are complementary and very good. Promote the improvement of the overall physical fitness level. Functional training emphasizes the specialization of special movements and movement modes of sports, and emphasizes the training of action patterns that improve the project, which can improve the effect and economy of completing the universal sports mode to improve athletic performance. The current research on functional training has been deeply studied in various sports. From the application of this training method to the practice of sports, the focus is on sports injury prevention, physical fitness and technology for high-level badminton players and adults. In terms of improvement, there are few studies on other aspects of physical fitness, especially in the special period of adolescents. There are few studies on the effects of functional training interventions on the physical strength of young badminton players during training. The results are still unclear. Therefore, the study of the impact of functional training on adolescent physical fitness may be a research focus in the future. Through in-depth exploration of the physical characteristics of adolescents in functional training, help coaches to improve their sports potential through scientific and reasonable methods and means to help athletes maximize sustainable development, in order to promote the advanced training system of China's badminton reserve talents, science and systems.

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